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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/528,788	03/17/2000	Ruediger Paschotta	FREIP030US	5723

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EXAMINER
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RODRIGUEZ, ARMANDO

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 12/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/528,788

Applicant(s)

PASCHOTTA ET AL.

Examiner

Armando Rodriguez

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 72-106 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 72-106 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.



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**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 72-87, 92-101 and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten et al (PN 5,987,049) in view of Wintner et al (PN 6,363,090).

Regarding claims 72-87, 92-101 and 106.

Weingarten et al illustrates in figure 4 a pulsed mode locked solid-state laser having an optical resonator with a semiconductor saturable absorber (11) within the resonator for passive mode locking and a pair of prism (16,17) for dispersion compensation. Weingarten et al also discloses the mode locking capabilities of a kerr lens (column 6).

Weingarten et al does not disclose the optical resonator having a thin disk gain medium with cooling means on one the faces, does not disclose the repetition of the pulse of 100MHz or less, does not disclose cavity dumping, does not disclose Q-switch mode locking and does not disclose power scalable pulses.

Wintner et al illustrates in figure 2 a laser system for producing power scalable short pulses having an optical resonator with a Yb:YAG thin disk (1), as described in the abstract. The thin disk is mounted on a heat sink (2), which provides cooling. Column 6

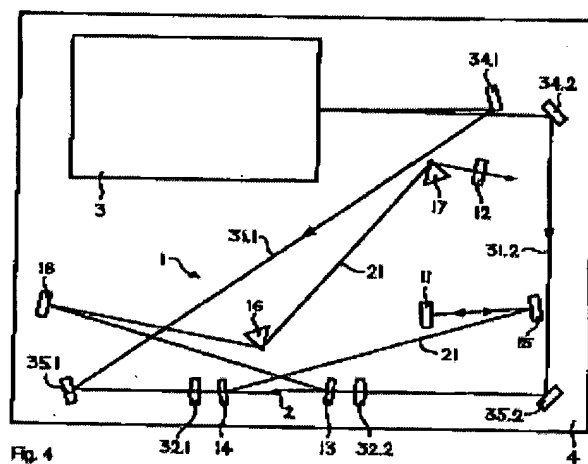
discloses the laser system obtaining pulse repetitions in the MHz by means of cavity dumping.

Therefore, it would have been obvious to a persona having ordinary skills in the art at the time the invention was made to combine the laser system of Weingarten et al with Wintner et al because Weingarten et al discloses that passive mode locking is fast enough to shape and stabilize ultra short pulses, as such pulses provided in the laser system of Wintner et al.

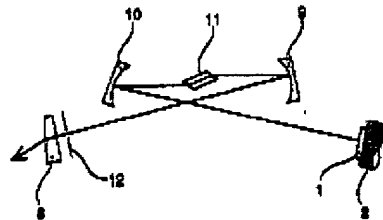
Regarding claim 87.

Examiner takes official notice of the use of a means for Q-switch mode locking.

Q-switch mode locking is a very well known and commonly used technique in the laser art.



**FIG. 2**



Claims 88-91 and 102-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten et al (PN 5,987,049) in view of Wintner et al (PN 6,363,090) as applied to claims 72 and 92 above, and further in view of Wallenstein (PN 5,828,424).

Weingarten et al and wintner et al do not disclose using frequency conversion means.

Wallenstein illustrates in figure 2 of a well-known common approach of frequency conversion of short pulses by using a noncritical phase matching crystal, as described in column 7.

Therefore, it would have been obvious to a persona having ordinary skills in the art at the time the invention was to use of such well-known techniques for frequency conversion within the laser system of Weingarten et al and Wintner et al because it would provide frequency doubling of the laser beam.

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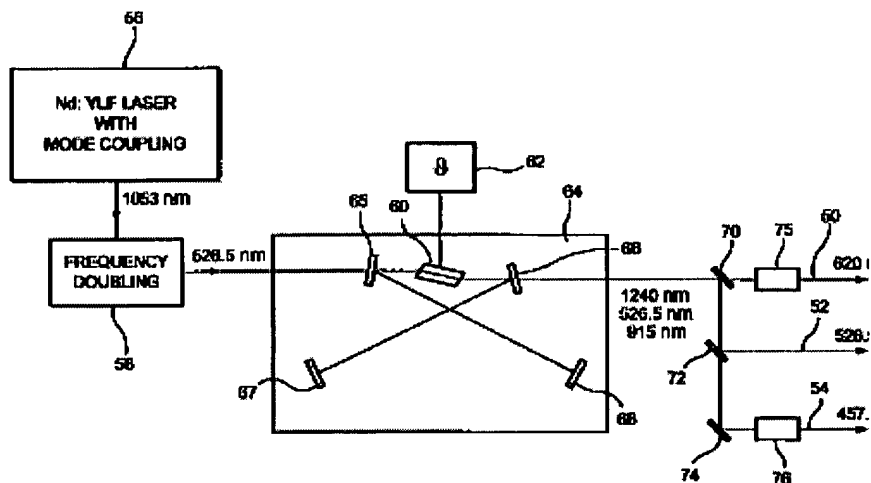


FIG. 2

### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is (703) 308-6218. The examiner can normally be reached on 10-hour day / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-4881.

*Armando Rodriguez*  
Armando Rodriguez  
Examiner  
Art Unit 2828

*Paul Ip*  
Paul Ip  
Supervisor  
Art Unit 2828

AR/PI  
November 20, 2002